HIGH SCHOOL AND UNIVERSITY MATRICULATION EXAMINATIONS BOARD.

DEPARTMENTAL EXAMINATIONS, 1926

CHEMISTRY 1.

Time—Three hours.

Values.

1. Describe experiments, *one each*, to illustrate the following:

2 (*a*) Physical change.

2 (*b*) A chemical change which results in chemical combination.

2 (*c*) A chemical change which results in chemical decomposition.

5 **2.** (*a*) Describe, using a diagram, the preparation of hydrogen from water by the electrolytic method.

2 (*b*) State what happens when a lighted taper is passed into an inverted jar of hydrogen and then slowly withdrawn.

4 (*c*) Describe an experiment to show the reducing action of hydrogen.

2 (*d*) Write an equation to express the reaction which takes place when steam is passed through a red hot iron tube containing clean iron filings.

3. Describe, using a diagram:

5 (*a*) A method of obtaining nitrogen from air.

3 (*b*) State *three* important economic uses of nitrogen or its compounds.

2 **4.** (*a*) Write an equation to express the reaction which takes place in the laboratory preparation of hydrogen chloride.

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1 (*b*) Name the other substance formed in the preparation of hydrogen chloride.

1 (*c*) How would you collect hydrogen chloride in the laboratory?

(*d*) Hydrogen chloride is passed into a solution of silver nitrate.

2 (1) Write the equation expressing the chemical reaction.

1 (2) Describe the appearance of the precipitate.

2 (3) State the chemical significance of the reaction in (*d*).

5 **5.** (*a*) Describe a laboratory method for the preparation and the collection of sulphur dioxide.

2 (*b*) Sulphur dioxide is passed into a solution of caustic potash until the solution is neutral to litmus paper. Write the equation expressing this reaction.

2 (*c*) State *two* important economic uses of sulphur dioxide.

5 **6.** (*a*) Name *five* properties which sodium and potassium have in common.

6 (*b*) Write equations to express the *three* reactions which take place in the manufacture of sodium carbonate by the LeBlanc process.

2 (*c*) State *four* economic uses of sodium carbonate.

6 **7.** Describe an experimental synthetic method to discover the proportions in which hydrogen and oxygen unite to form water.

1 **8.** (*a*) What is a hydroxide?

3 (*b*) Show by description of an experiment how to form the hydroxide of potassium.

5 (*c*) Write formulae for the hydroxides of calcium, ammonium, zinc, iron and magnesium.

9. Write an equation expressing the reaction which takes place in *each* of the following:

2 (*a*) The preparation of chlorine by Deacon's process.

2 (*b*) Chlorine is passed into a solution of sodium thiosulphate in water.

Values.

4 (*c*) Sodium carbonate and sulphuric acid are mixed in a test tube, and the gas formed is passed into lime water.

2 (*d*) Water is added drop by drop to aluminium carbide contained in a glass vessel.

2 (*e*) Sulphuric acid is prepared by the contact method.

2 **10.** (*a*) State the law of multiple proportions.

4 (*b*) Illustrate the law asked for in (*a*), by using the compounds which carbon and hydrogen respectively form with oxygen.

2 (*c*) State Dalton's atomic theory.

7 **11.** Two hundred and fourteen grams of pure ammonium chloride are heated with an excess of slaked lime until all reaction ceases. The gas given off is collected and measured at 17°C temperature and 780 mm. pressure. Find its volume. (N=14, H=1, Cl=35.5, Ca=40, O=16.)

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